(C) Exercise

In questions 1 to 25, there are four options out of which one is correct. Choose the correct answer.

1. A number which can be expressed as $\frac{p}{q}$ where p and q are integers and $q \neq 0$ is

(a) natural number. (b) whole number.

(c) integer. (d) rational number.

2. A number of the form $\frac{p}{q}$ is said to be a rational number if

(a) p and q are integers.

(b) p and q are integers and $q \neq 0$

(c) p and q are integers and $p \neq 0$

(d) p and q are integers and $p \neq 0$ also $q \neq 0$.

3. The numerical expression $\frac{3}{8} + \frac{(-5)}{7} = \frac{-19}{56}$ shows that

(a) rational numbers are closed under addition.

(b) rational numbers are not closed under addition.

(c) rational numbers are closed under multiplication.

(d) addition of rational numbers is not commutative.

4. Which of the following is not true?

(a) rational numbers are closed under addition.

(b) rational numbers are closed under subtraction.

(c) rational numbers are closed under multiplication.

(d) rational numbers are closed under division.

5. $-\frac{3}{8} + \frac{1}{7} = \frac{1}{7} + \left(\frac{-3}{8}\right)$ is an example to show that

(a) addition of rational numbers is commutative.

(b) rational numbers are closed under addition.

(c) addition of rational number is associative.

(d) rational numbers are distributive under addition.

7. Zero (0) is

(a) the identity for addition of rational numbers.

(b) the identity for subtraction of rational numbers.

(c) the identity for multiplication of rational numbers.

(d) the identity for division of rational numbers.

8. One (1) is

(a) the identity for addition of rational numbers.

(b) the identity for subtraction of rational numbers.

(c) the identity for multiplication of rational numbers.

(d) the identity for division of rational numbers.

9. The additive inverse of $\frac{-7}{19}$ is

(a) $\frac{-7}{19}$ (b) $\frac{7}{19}$ (c) $\frac{19}{7}$ (d) $\frac{-19}{7}$

10. Multiplicative inverse of a negative rational number is

(a) a positive rational number.

(b) a negative rational number.

(c) 0

(d) 1

11. If $x + 0 = 0 + x = x$, which is rational number, then 0 is called

(a) identity for addition of rational numbers.

(b) additive inverse of x.

(c) multiplicative inverse of x.

(d) reciprocal of x.

12. To get the product 1, we should multiply $\frac{8}{21}$ by

(a) $\frac{8}{21}$ (b) $\frac{-8}{21}$ (c) $\frac{21}{8}$ (d) $\frac{-21}{8}$

13. $-(-x)$ is same as

(a) $-x$ (b) x (c) $\frac{1}{x}$ (d) $\frac{-1}{x}$

14. The multiplicative inverse of $-1\frac{1}{7}$ is

(a) $\frac{8}{7}$ (b) $\frac{-8}{7}$ (c) $\frac{7}{8}$ (d) $\frac{7}{-8}$

15. If x be any rational number then $x + 0$ is equal to

(a) x (b) 0 (c) $-x$ (d) Not defined

16. The reciprocal of 1 is

(a) 1 (b) -1 (c) 0 (d) Not defined

17. The reciprocal of -1 is

(a) 1 (b) -1 (c) 0 (d) Not defined

18. The reciprocal of 0 is

(a) 1 (b) -1 (c) 0 (d) Not defined

19. The reciprocal of any rational number $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is

(a) $\frac{p}{q}$ (b) 1 (c) 0 (d) $\frac{q}{p}$

20. If y be the reciprocal of rational number x, then the reciprocal of y will be

(a) x (b) y (c) $\frac{x}{y}$ (d) $\frac{y}{x}$

19. The reciprocal of any rational number $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is

(a) $\frac{p}{q}$ (b) 1 (c) 0 (d) $\frac{q}{p}$

20. If y be the reciprocal of rational number x, then the reciprocal of y will be

(a) x (b) y (c) $\frac{x}{y}$ (d) $\frac{y}{x}$

21. The reciprocal of $\frac{-3}{8} \times \left(\frac{-7}{13}\right)$ is

(a) $\frac{104}{21}$ (b) $\frac{-104}{21}$ (c) $\frac{21}{104}$ (d) $\frac{-21}{104}$

22. Which of the following is an example of distributive property of multiplication over addition for rational numbers.

(a) $-\frac{1}{4} \times \left\{\frac{2}{3} + \left(\frac{-4}{7}\right)\right\} = \left[-\frac{1}{4} \times \frac{2}{3}\right] + \left[-\frac{1}{4} \times \left(\frac{-4}{7}\right)\right]$

(b) $-\frac{1}{4} \times \left\{\frac{2}{3} + \left(\frac{-4}{7}\right)\right\} = \left[\frac{1}{4} \times \frac{2}{3}\right] - \left(\frac{-4}{7}\right)$

(c) $-\frac{1}{4} \times \left\{\frac{2}{3} + \left(\frac{-4}{7}\right)\right\} = \frac{2}{3} + \left(-\frac{1}{4}\right) \times \frac{-4}{7}$

(d) $-\frac{1}{4} \times \left\{\frac{2}{3} + \left(\frac{-4}{7}\right)\right\} = \left\{\frac{2}{3} + \left(\frac{-4}{7}\right)\right\} - \frac{1}{4}$

23. Between two given rational numbers, we can find

(a) one and only one rational number.

(b) only two rational numbers.

(c) only ten rational numbers.

(d) infinitely many rational numbers.

24. $\frac{x+y}{2}$ is a rational number.

(a) Between x and y

(b) Less than x and y both.

(c) Greater than x and y both.

(d) Less than x but greater than y.

25. Which of the following statements is always true?

(a) $\frac{x-y}{2}$ is a rational number between x and y.

(b) $\frac{x+y}{2}$ is a rational number between x and y.

(c) $\frac{x \times y}{2}$ is a rational number between x and y.

(d) $\frac{x \div y}{2}$ is a rational number between x and y.

In questions 26 to 47, fill in the blanks to make the statements true.

26. The equivalent of $\frac{5}{7}$, whose numerator is 45 is _____.

27. The equivalent rational number of $\frac{7}{9}$, whose denominator is 45 is _____.

28. Between the numbers $\frac{15}{20}$ and $\frac{35}{40}$, the greater number is _____.

29. The reciprocal of a positive rational number is _____.

30. The reciprocal of a negative rational number is _____.

31. Zero has _____ reciprocal.

32. The numbers _____ and _____ are their own reciprocal.

33. If y be the reciprocal of x, then the reciprocal of y^2 in terms of x will be _____.

34. The reciprocal of $\frac{2}{5} \times \left(\frac{-4}{9}\right)$ is _____.

35. $(213 \times 657)^{-1} = 213^{-1} \times$ _____.

36. The negative of 1 is _____.

Assertion and Reasoning Questions on Rational Numbers

1. Assertion (A): The sum of two rational numbers is always a rational number.
Reason (R): Rational numbers are closed under addition.

2. Assertion (A): The product of two non-zero rational numbers is never zero.
Reason (R): Zero multiplied by any rational number gives zero.

3. Assertion (A): Every integer is a rational number.
Reason (R): Rational numbers include numbers that can be expressed as a fraction with a non-zero denominator.

4. Assertion (A): The difference between two rational numbers is always a rational number.
Reason (R): Rational numbers are not closed under subtraction.

5. Assertion (A): Multiplicative inverse of 1 is 1.
Reason (R): 1 multiplied by 1 is 1.

6. Assertion (A): Zero has no reciprocal.
Reason (R): Reciprocal of a number is 1 divided by that number.

7. Assertion (A): Negative of a rational number is also a rational number.
Reason (R): Rational numbers are closed under additive inverse.

8. Assertion (A): Rational numbers are not closed under division.
Reason (R): Division by zero is not defined.

8. Assertion (A): Rational numbers are not closed under division.
Reason (R): Division by zero is not defined.

9. Assertion (A): The sum of a rational number and its additive inverse is zero.
Reason (R): Additive inverse of a rational number is also rational.

10. Assertion (A): 0 is the additive identity for rational numbers.
Reason (R): Adding zero to a rational number gives the same number.

11. Assertion (A): A rational number multiplied by its reciprocal is 1.
Reason (R): The product of a number and its multiplicative inverse is 1.

12. Assertion (A): The reciprocal of a negative rational number is also negative.
Reason (R): Reciprocal of a number retains the sign of the number.

13. Assertion (A): Rational numbers can be plotted on the number line.
Reason (R): Rational numbers have a definite position on the number line.

14. Assertion (A): Between any two rational numbers, there is another rational number.
Reason (R): Rational numbers are dense in nature.

15. Assertion (A): The quotient of two rational numbers is always a rational number.
Reason (R): Rational numbers are closed under division.

16. Assertion (A): The rational number 2/3 is equal to 4/6.
Reason (R): Equivalent rational numbers represent the same value.

17. Assertion (A): Rational numbers include fractions and integers.
Reason (R): Every integer can be written as a rational number with denominator 1.

17. Assertion (A): Rational numbers include fractions and integers.
Reason (R): Every integer can be written as a rational number with denominator 1.

18. Assertion (A): Rational numbers can be both positive and negative.
Reason (R): Rational numbers include all numbers that can be expressed as p/q, where $q \neq 0$.

19. Assertion (A): Rational numbers have terminating or repeating decimal representations.
Reason (R): All rational numbers can be expressed as either terminating or repeating decimals.

20. Assertion (A): The rational number $-7/3$ lies to the left of -2 on the number line.
Reason (R): $-7/3$ is less than -2.